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# Science Update

## Early Feeding May Help a Premie Go Home Sooner

Premature infants who receive small amounts of breast milk or formula within days of birth, in addition to intravenous (IV) feedings, may get a boost in intestinal development. That's the preliminary finding of an ARS study. The scientists say the developmental boost may enable a premie to more quickly tolerate regular oral feedings—a prerequisite to hospital release. The 70 preemies in the ARS study all weighed under 2-1/2 pounds at birth. Beginning at 4 days, half the infants received either breast milk or formula—less than one-quarter cup per day—for 2 weeks. Over the following few weeks, these babies had more active lactase enzymes than the other infants, who had only IV feedings. The lactase enzyme digests lactose, milk's principal sugar. For years, doctors have given very-low-birth-weight infants only IV feedings for the first 2 weeks, because these babies did not make the enzyme. Doctors have believed that undigested sugar from breast milk or formula would increase the risk of a medical complication that can destroy the intestinal lining. *Robert Shulman, USDA-ARS Children's Nutrition Research Center, Houston, Texas, phone (713) 798-7145.*

## When Crops Need a Drink, Soil Can Turn On the Faucet

A cooperative research and development agreement could lead to more efficient irrigation systems for commercial fruits and vegetables, landscaping, nurseries, and home gardens. ARS scientists will merge their patented tensiometer valve with a pulse irrigation system patented by Intertec, Inc., of Lynchburg, Virginia. As the soil dries, increasing

suction makes the tensiometer valve open, so water is delivered as needed. Then, when the soil receives enough water, suction decreases and the valve closes. The system requires no electricity or wiring. The tensiometer valve can reduce water use and leaching of fertilizer nutrients below the root zone, while maintaining high crop productivity. *D. Michael Glenn and D.L. Peterson, USDA-ARS Appalachian Fruit Research Station, Kearneysville, West Virginia, phone (304) 725-3451.*

## Biotech Wheat for Lighter Loaves

Better breads and other baked goods for tomorrow may result from ARS scientists' success at genetically engineering wheat. The advance could also raise wheat's value to growers—by increasing the likelihood the grain has protein qualities wanted by bakers and millers. The ARS scientists are the first to boost the amount of breadmaking proteins—known as high-molecular-weight glutenins—in wheat kernels by using molecular biology. They raised the proteins' amounts up to 50 percent in kernels of bioengineered wheat they grew in the greenhouse. So far, eight successive generations of plants have retained the trait. Sometime in 1997, the scientists anticipate having enough flour from the experimental plants to bake test loaves. They expect flour with high levels of the proteins to produce baked loaves that are light and fine-textured. For the experiments, they used a genetic on-off switch called a promoter. This promoter might also be useful in raising or lowering other key proteins. If so, wheat might be engineered to produce an array of new baking flours or wheat byproducts for industrial use. *Ann E. Blechl, USDA-ARS Western Regional Research Center, Albany, California, phone 510-559-5716.*

## With Soybean Oil, Bacteria May Wax Eloquent

With a little bacterial alchemy, liquid waxes could be made from the oil of surplus soybeans, replacing sperm whale oil used for a variety of commercial products. These include luxury soaps, leather preservatives, insecticide carriers, lamp oil, and even artificial flavorings. From soybean oil, ARS researchers extracted oleic acid, a fatty acid. Then they fed the oleic acid to bacteria in the *Acinetobacter* family. The microbes turned some of the acid into alcohol, then linked the alcohol and remaining oleic acid to form the liquid waxes. Economists estimate a potential 185-million-bushel soybean surplus in 1997. *Larry K. Nakamura, USDA-ARS National Center for Agricultural Utilization Research, Peoria, Illinois, phone (309) 681-6395.*

## Tanners Might Replace an Old Salt With a Potassium One

Could potassium chloride replace common salt now used in the meat packing and tanning industries to preserve animal hides? To investigate the potential of a new ARS-developed process using potassium chloride, the agency has joined with Kalium Canada, Ltd., of Regina, Saskatchewan. Switching to potassium chloride would enable the packing and tanning industries to eliminate an environmental problem: the disposal of used salt brine. Unlike sodium, potassium is a plant nutrient. So waste from the new process could be recycled for use as crop fertilizer. ARS scientists have shown that the process does not affect leather quality and are working with the industries to demonstrate how it works. Kalium Canada is a subsidiary of Vigro, a U.S. firm. *William N. Marmer, USDA-ARS Eastern Regional Research Center, Wyndmoor, Pennsylvania, phone (215) 233-6585.*